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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/688,181	10/16/2000	HIDEYUKI KURITA	107594	8580

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EXAMINER

LEE, GRANVILL D

ART UNIT PAPER NUMBER

2825

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/688,181

Applicant(s)

KURITA ET AL.

Examiner

Granvill D Lee, Jr

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Applicant's Argument***

After review of applicant's amendments and comments, the examiner finds such arguments unpersuasive, in view of the prior art of record.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims ~~1~~<sup>3</sup>-4, 6, 10-13, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan. Doc. (1-202898) in view of Japan. Doc. (5327212).

In view of claims ~~1~~<sup>7</sup> and 12, Japan. Doc. (1-202898). discloses a manufacturing process where a multi-layered flexible wiring board consisting of a film layer (Fig. 2a #16) and metal wirings (#15 & #25) which can be laminated with many other boards in close contact (Fig. 1a&b). Japan Doc. 1-202898 also depicts a tipped device contacting these surfaces for thermal-compression bonding tool (Fig. b). But Japan. Doc 1-202898 falls to include an ultrasonic process to conduct the bonding.

Japan. Doc. (5-327212) depicts a process that uses ultrasonic waves to bond two boards together through their respective conductive bonding areas.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of Japan Doc. 1-202898 with those of Japan Doc. 5-327212 with the likelihood of achieving better individual soldering results, since now ultrasonic soldering can be made to any joint, chip or board in the soldering process, with an energy source, and not by applying thermal-compression alone.

In view of claim 3, Japan Doc. 1-202898 discloses trace wirings (Fig. # 13,14 ... ) in close proximity to each other, so that upon thermal bonding of the traces a contact forms to wirings and the areas between.

In view of claim 4, upon heating Japan Doc. 1-202898 can laminate several boards together.

In view of claim 6, Japan Doc. 1-202898 discloses a manufacturing process where a plurality of boards are bonded.

In further view of claims 10, 11 and 22, Japan Doc. 1-202898 points out that the metal wirings can be made in various ways, for example if we note that a second opening can be designed on the lower portion of the board and form a concave structure (Fig. I # 12) this is exactly the opposite as the convex structure that can be designed (Fig. 6 # 16).

This latter structure that is a natural variation of the former structure, and can still fulfill the bonding requirements.

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In view of claims 13 and 20, Japan Doc. 5-327212 teaches that the adhesion layer (Fig. 3 #25) surrounding the metal pad (Fig. 3# 12) can be dielectric or conductive.

Claims 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan. Doc. (1-202898) in view of Japan. Doc. (5-327212) and in further of Gerber et al. (WO 94/29897).

Japan. Doc. (1-202898). discloses a manufacturing process where a multi-layered flexible wiring board consisting of a film layer (Fig. 2a #16) and metal wirings (#15 & #25) which can be laminated with many other boards in close contact (Fig. 1a&b). Japan Doc. 1-202898 also depicts a tipped device contacting these surfaces for thermal-compression bonding tool (Fig. b). Doc. (5-327212) depicts a process that uses ultrasonic waves to bond two boards together through their respective conductive bonding areas. But both Japanese documents fail to include the metallurgies of the materials used. Gerber et al. teaches that various metals can be used at different temperatures in the bonding process. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of both the Japanese documents to develop wider range applications, using a wider range of materials.

In view of claims 17-18, Gerber et al. teaches that suitable metals for the cover layer are tin, lead or gold alloys (Pg. 9 lines 5- 10).

In view of claim 19, Gerber et al. states that typically bump, pads or any interconnections can have the same or different metallurgies, and that a stable bond is of importance (Pg. lines 1-6).

In view of claim 21, Gerber et al. teaches that the adhesion layer (Fig. 9 #58) with a cover metal layer has an upper limit melting temperature (Pg. 9 lines 12-15).

### ***Response to Applicant***

The examiner still believes that the prior art reads on the cited claims. In regard to the two flexible wiring board pieces in close contact; the important feature is not that boards are placed together and bonded, but they are bonded together at similar metallic points or regions, since the prior art suggests this, the focus would shift to the ultrasonic technique used. That is, the process does not bond all metals the same (as you have shown) and therefore data regarding relationship of metals and *ultrasonic* bonding properties should be considered.

### ***Final Action***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In

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no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

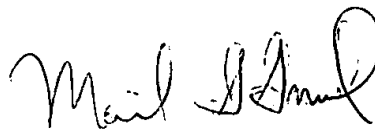
Any inquiry concerning this communication or earlier communications for the examiner should be directed to Granvill Lee whose telephone number is (703) 306-5865. The examiner can be normally reached on Monday thru Thursday from 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are not successful, the examiner's supervisor, Matthew Smith can be reached on (703) 3081323. The fax phone number for this group is (703) 308-7722.

Any inquiry of a general nature relating to status or otherwise should be directed to the receptionist whose telephone number is 703-308-1782.

Examiner  
Granvill Lee  
Art Unit 2825

GI 4/4/03



MATTHEW SMITH  
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